REMARKS

By this Preliminary Amendment, Applicant has amended claims 12, 16, 17 and 20. Claims 2, 7 and 12-20 are pending.

Claim Rejections Under Section 103

In the Office Action dated November 18, 2002, the Examiner rejected claims 2, 7 and 12-20 under 35 U.S.C. § 103(a) as being unpatentable over Sun in view of Tahara. The Examiner continued in this rejection in an Advisory Action dated March 11, 2003. Applicant respectfully disagrees with the explanation of the operation of coding a dynamic image signal relative to Figure 4 of the Tahara Patent as set forth in the above noted Office Action and Advisory Action.

Claims 12, 16, 17 and 20 are independent claims. Claims 2, 13-15 are dependent on claim 12. Claims 18 and 19 are dependent on claim 17.

Turning first to independent claim 12, it is directed to a method for **decoding** an image signal representing motion, the image signal being a bit stream of a coded compressed video signal. The method of claim 12 includes the following steps:

- decoding the bit stream for information defining pixel blocks, **the information including motion vectors**;
- detecting an error in the information of one of the pixel blocks **in each of the at least two frames which are prior to a present frame**;
- storing error information of the one of the pixel blocks in each of the at least two frames which are prior to the present frame, in an error memory;
- storing, in a frame memory, video information of the at least two frames which are prior to the present frame;
- **generating from the decoded motion vectors at least two predicted pixel blocks corresponding to a present pixel block in the present frame;**
- **judging if one of the at least two predicted pixel blocks corresponds to error information of the at least two frames stored in the error memory; and**

- **based on the judging, determining if the one of the at least two predicted pixel blocks is used in reconstructing the present pixel block.**

In the Office Action, the Examiner admits that the Sun Patent fails to teach the feature of Applicant's claim 12 concerning "at least two frames which are prior to a present frame." The Examiner relies on the Tahara Patent to rectify this deficiency. But it is Applicant's contention that this feature of Applicant's claimed invention concerning the two prior frames to the present frame and the use of these two frames is not taught or suggested in the Tahara Patent.

The Examiner's rejection is based on Figure 4 of the Tahara Patent which relates to a principle for coding a dynamic image signal, and particularly the motion vectors x2 and x3 shown therein. According to the discussion of Figure 4 at column 5, lines 4-42 of the Tahara Patent, four coding methods are considered for data transmission. But only the coding methods which lessen the amount of data transmission is selected. From Applicant's review of the Tahara Patent, it is apparent that motion vectors x2 and x3 are not used <u>together</u> as one of the four coding methods. In other words, the Examiner is mistaken that motion vectors x2 and x3 are the same as the motion vectors defined in claim 12 and are used in the same way as the motion vectors defined in claim 12. The Tahara Patent does <u>not</u> use motion vectors x2 and x3 together to generate pixel blocks of two frames prior to a present frame. And the Tahara Patent does <u>not</u> use motion vectors x2 and x3 to determine if one of these pixel blocks is used to reconstruct the present pixel block as required in Applicant's claimed invention. Because the Tahara Patent uses motion vectors x2 and x3 in a different way than Applicant's claimed invention, one of ordinary skill would not consider using such teaching to achieve the steps of Applicant's claim 12 of "generating from the decoded motion vectors at least two predicted pixel blocks corresponding to a present pixel block; judging if one of the at least two predicted pixel blocks corresponds to error information of the at least two frames stored in the error memory; and based on the judging, determining if the one of the at least two predicted pixel blocks is used in reconstructing the present pixel blocks."

Applicant notes that there is a further difference between Applicant's claim 12 and Figure 4 of the Tahara Patent. Specifically, claim 12 relates to a method of <u>decoding</u> whereas Figure 4 of the Tahara Patent relates to a method of <u>encoding</u>.

Encoding is different than decoding. This difference between encoding and decoding is apparent from the Tahara Patent itself. Figure 13 of the Tahara Patent relates to decoding. In this decoding process, Tahara uses only one motion vector for generating only one block. There is no teaching or suggestion in Figure 13 of the requirement of Applicant's claim 12 of generating "at least two predicted pixel blocks corresponding to a present pixel block in the present frame," where the two predicted pixel blocks represent two frames which are prior to the present frame. Because of the difference between encoding and decoding as described in the Tahara Patent, the Tahara Patent itself supports Applicant's position that the decoding method of claim 12 is not taught by the Tahara Patent.

There are further differences between Applicant's claimed invention and the disclosure of the Tahara Patent. The Tahara Patent discusses a coding technology for bi-directional prediction which contribute to coding efficiency. A predicted image, predicted from a plurality of reference frames, is matched better than the predicted image which is predicted from a single reference frame. By using the average of a plurality of predicted images, the noise -- difference from the present image -- of the predicted image is reduced, so the coding efficiency is increased. This is in contrast to Applicant's claimed invention which relates to a decoding process. Among a plurality of predictive pictures, a predictive picture which is destroyed by error is not used for decoding. Only the predicted picture which includes no error is used for decoding. This predicted picture which includes no error could be a plurality of pictures. This feature of Applicant's claimed invention further distinguishes Applicant's invention from the teaching of the Tahara Patent.

The above noted features of claim 12 are also found in independent claims 16, 17 and 20. Thus all pending claims are patentably distinguished from the Tahara Patent, as well as the Sun Patent.

Based on the foregoing remarks, Applicant respectfully submits that pending claims 2, 7 and 12-20 are in condition for allowance and thereby request an early allowance of these claims.

Respectfully Submitted,

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April 16, 2003 Daniel N. Calder

VERSION WITH MARKINGS TO SHOW CHANGES MADE

CLAIMS

12. (Twice Amended) A method for decoding an image signal representing motion, the image signal being a bit stream of a coded compressed video signal, the method comprising the steps of:

decoding the bit stream for information defining pixel blocks, the information including motion vectors;

detecting an error in the information of one of the pixel blocks in each of at least two frames which are prior to a present frame;

storing error information of the one of the pixel blocks in each of the at least two frames which are prior to the present frame, in an error memory;

storing, in a frame memory, video information of the at least two frames which are prior to a present frame;

generating~~,~~ from the decoded motion vectors~~at least two frames,~~ at least two predicted pixel blocks corresponding to a present pixel block in the present frame;

judging if one of the at least two predicted pixel blocks corresponds to error information of the at least two frames stored in the error memory; and

based on the judging, determining if the one of the at least two predicted pixel blocks is used in reconstructing the present pixel block.

16. (Twice Amended) A method for decoding an image signal representing motion and reconstructing video frames of the image signal, the method comprising the steps of:

decoding the image signal for information to define pixel blocks of video frames, the information including motion vectors;

generating decoding error maps indicating decoding errors of pixel blocks in each of at least two frames which are prior to a present video frame;

storing the decoding error maps in error memory;

storing, in a frame memory, video information of the at least two frames which are prior in time to the present video frame;

generating~~,~~ from the decoded motion vectors~~at least two frames,~~ at least two predicted pixel blocks corresponding to a present pixel block in the present video frame;

determining if a predicted pixel block includes decoding errors corresponding to decoding errors in either of the at least two frames which are prior to the present frame; and

based on the determining, judging if the predicted pixel block is used in reconstructing the present video block.

17. (Amended) A decoding apparatus for decoding an image signal representing motion; the decoding apparatus comprising;

a decoding device for decoding the image signal to define pixel blocks of video frames, the image signal including motion vectors;

means for detecting decoding errors of the pixel blocks in each of at least two frames which are prior to a present video frame;

an error memory for storing decoding error maps of the decoding errors of the pixel blocks in each of the at least two frames which are prior to the present frame;

motion compensation means for generating from the decoded motion vectors at least two predicted pixel blocks corresponding to a present block in a present video frame; and

predicted image selecting means, based on the decoding error maps, determining if the predicted pixel blocks include decoding errors corresponding to decoding errors in either of the at least two frames which are prior to the present frame, and thereby determining use of the predicted pixel blocks in reconstructing the present block.

20. (Amended) A decoding apparatus for decoding an image signal representing motion, the image signal being a bit stream of a coded compressed video signal, the decoding apparatus comprising:

means for decoding the bit stream for information defining pixel blocks, the information including motion vectors;

means for detecting an error in the information of one of the pixel blocks in each of at least two frames which are prior to a present frame;

means for storing error information of the one of the pixel blocks in each of the at least two frames which are prior to the present frame;

means for storing video information of the at least two frames which are prior to a present frame;

means for generating~~,~~ from the decoded motion vectors~~at least two frames,~~ at least two predicted pixel blocks corresponding to a present pixel block in the present frame;

means for judging if one of the at least two predicted pixel blocks corresponds to error information of the at least two frames stored in the means for storing; and

means for determining if the one of the at least two predicted pixel blocks is used in reconstructing the present block, based on judging of the means for